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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/990,572	11/23/2001	Osama Moselhi	6446-17US JA/IC/AD	2015

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EXAMINER
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CHAWAN, SHEELA C

ART UNIT	PAPER NUMBER
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2625

DATE MAILED: 09/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/990,572

Applicant(s)

MOSELHI ET AL.

Examiner

Sheela C. Chawan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 24 May 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 4-39 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 4-10, 15-28 and 32-39 is/are rejected.
- 7) ☒ Claim(s) 11-13 and 29-31 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 October 2003 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date Nov 26, 2003.

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

**DETAILED ACTION**

***Response to Amendment***

1. Applicant's amendment filed on May 24, 2005 has been entered and made of record.

Claims 4 -39 are pending in the application.

***Response to Arguments***

2. Applicant's arguments, see page 2, lines 15-18 of the remarks, filed May 24, 2005, with respect to rejection of claims 4-39 under 102(e) have been fully considered and are persuasive. Therefore, the 102(e) rejection of claims 4-39 has been withdrawn. However, upon further consideration, a new ground(s) of rejection 102 (a) in view of Osama Moselhi et al., Listed in IDS "Classification Of Defects In Sewer Pipes Using Neural Networks". Journal of infrastructure system Sept 2000, Page 97- 104.

***Drawings***

3. The Examiner has approved drawings filed on 10/9/03.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

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Claims 4-10,14-28,32-39 are rejected under 35 U.S.C. 102(a) as being anticipated by Osama Moselhi et al., Listed in IDS "Classification Of Defects In Sewer Pipes Using Neural Networks". Journal of infrastructure system Sept 2000, Page 97-104.

The applied reference has a common assignee, with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

As to claim 4, Moselhi discloses a method for detecting a plurality of defects in an item under inspection comprising (abstract, the system automatically detect defects in underground sewer pipes and the primary focus is on neural networks in the classification of those defects, page 97 introduction paragraph):

acquiring at least one image of said item (note fig 2, CCTV camera acquires images of inner surface of a pipe);

providing a plurality of neural networks (fig 1 and 2, plurality of neural networks are used using the back-propagation method to classify four types of defects such as, cracks, joint displacement, reduction of cross-section area and spalling, page 97, introduction paragraph) at least one of said plurality of neural networks corresponding to each one of said plurality of defects to be detected (page 98, fig 1);

processing said at least one image to produce a processed image having objects isolated from an image background of said image (page 99, data preparation paragraph); and

inputting said processed image into said plurality of neural networks to obtain information concerning corresponding defects (fig 1 and 2, shows plurality of neural networks by using the back-propagation method to classify four types of defects such as, cracks, joint displacement, reduction of cross-section area and spalling, see page 97, introduction paragraph, fig 1).

As to claims 5 and 24, Moselhi discloses a method, further comprising issuing a report using said information concerning said defects (fig 2).

As to claims 6 and 25, Moselhi discloses a method, wherein said plurality of neural networks further comprises sets of neural networks used for counter-checking results, each one of said sets of similar neural networks corresponding to each one of said plurality of defects to be detected (fig 9, row in the table corresponds to actual defects that were detected by the image analysis software and also in fig 11 using neural network to classify different defects with 100% accuracy).

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As to claim 7, Moselhi discloses a method, wherein processing said at least one image further comprises processing said at least one image according to a selected set of image analysis techniques said set of image analysis techniques selected as a function of said defects to be detected (note, scaling and activation function are used to bind the input and output to a specific range that neural networks can deal with efficiently. The most commonly functions which are used as linear or nonlinear function, page 100 fig 6 and 7, page 99, neural network design paragraph).

As to claims 8 and 26, Moselhi discloses a method, wherein n sets of neural networks are used to detect n types of defects (fig 1 and 2, plurality of neural networks are used using the back-propagation method to classify four types of defects such as, cracks, joint displacement, reduction of cross-section area and spalling, page 97, introduction paragraph, fig 3, 4 and 5).

As to claims 9 and 27, Moselhi discloses a method wherein said item under inspection is a sewer pipe n corresponds to 5 (table 2, shows plurality of inspection item based on defects in fig 3, 4 and 5 said plurality of defects are shown such as deposits, cross-sectional reductions, misalignments, infiltration, and cracks, page 101, table 2).

As to claims 10 and 28, Moselhi discloses a method, wherein deposits, cross-sectional reductions, and misalignments correspond to a first set of image analysis techniques (note, misalignment corresponds to joint displacement, table 2 and 3 of column 4 shows misalignment data), infiltration corresponds to a second set of image analysis techniques, and cracks correspond to a third set of image analysis techniques (table 2 and 3 of column 2 page 102 fig 9 of example application paragraph).

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As to claims 14 and 32, Moselhi discloses a method wherein said neural networks are back propagation neural networks (fig 1, 2, page 97 back - propagation and page 98 talks about proposed model and system description).

As to claims 15 and 33, Moselhi discloses a method wherein said acquiring an image comprises using a closed circuit television camera and a videotape (fig 2).

As to claims 16 and 34, Moselhi discloses a method, wherein said videotape is digitized (fig 2 note, the VCR feeds the information captured on the tape to a computer which is equipped with frame grabber .The frame grabber captures and digitizes the frames of the acquired images).

As to claim 17, Moselhi discloses a method, wherein each set of neural networks comprises at least three neural networks used for counter-checking results (table 1, page 100, model training paragraph and also page 101).

As to claims 18 and 35, Moselhi discloses a method comprises determining a position of said objects in said item under inspection (fig 2).

As to claims 19 and 36, Moselhi discloses a method, further comprising recommending a rehabilitation technique based on said report and a set of attributes of said item under inspection (fig 8 and fig 12, page 100, model training paragraph).

As to claims 20 and 37, Moselhi discloses a method, wherein said attributes are part of a group comprising technical requirements, contractual requirements, and cost effectiveness (page 100, model training paragraph, page 101 right column the very last paragraph talks about an effort to improve the performance of the network and also see table 2).

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As to claims 21 and 38, Moselhi discloses a method wherein a plurality of rehabilitation techniques is recommended (page 100, model paragraph, page 101 left column the very first paragraph talks about sewer rehabilitation).

As to claims 22 and 39, Moselhi discloses a method further comprising ranking said plurality of recommended rehabilitation techniques (page 100 -101, model training paragraph talks about rehabilitation techniques).

Regarding claim 23, argument analogous those presented for claim 4 are applicable to claim 23. Regarding selecting a set of image analysis techniques as a function of said selected defect as discloses by Moselhi as follow (page 99- 100 paragraph neural network design).

#### ***Allowable Subject Matter***

5. Claims 11-13,29 -31 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.



***Other prior art cited***

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Vachtesvanos et al., (US. 6,650,779 B2) discloses method and apparatus for analyzing an image to detect and identify patterns.

Klein (US.5,845,285) discloses computer system and method of data analysis.

Greene et al., (US.5,533,383) discloses integrated acoustic leak detection processing system.

Marx (US.4,974,168) discloses automatic pipeline data collection and display system.

Van Den Bosch (US.5,742,517) discloses method for randomly accessing stored video and field inspection system employing the same.


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**Contact Information**

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sheela C Chawan whose telephone number is. 571-272-7446 The examiner can normally be reached on Monday - Friday 7.30 - 4.00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on 571-272-7453 . The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Sheela Chawan  
Patent Examiner  
Group Art Unit 2625  
August 1, 2005